Cow/Calf Split Sessions II

Moderator - Peter Denooy

Cowchips$: A Decision Making Tool for Commercial Cow-calf Managers

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Background

Cow-calf production in Alberta is based on 2.6 million cows and bred heifers on approximately 30,000 farms and ranches. Typically these operations are mixed beef and grain with over 90% raising cattle for commercial beef production rather than for seedstock. Over 99% are spring calving with multi-sire breeding pastures and weaning in September through November. Genetic improvement in commercial herds typically occurs through the purchase of superior sires. Most managers keep only herd records and minimal financial records. Ten to 20% of commercial cow-calf managers and approximately 2000 seedstock producers keep more detailed individual cow and financial records. A useful record keeping system for commercial cow-calf producers should have the following characteristics:

- production measures are based on the biological cycle of the cow,
- cow-based rather than progeny-based,
- flexible enough to keep records on either a herd or individual cow basis,
- can assess the lifetime productivity of the brood cow,
- can assess the cost of production, and
- helps the manager interpret their reports.

The purpose of this paper is to evaluate the strengths and weaknesses of *Cowchip$* by analysing four years (1992 to 1995) of records from a spring calving, commercial cow-calf herd. Several of the more useful reports generated by the program as well as the scientific rationale behind these reports will be presented.

Introduction

Cowchip$* is a microcomputer program developed to assist managers, veterinarians, specialists and consultants take an integrated approach to identifying opportunities for profit in commercial cow-calf herds. It is DOS based and also helps the user formulate rations for beef cattle and investigate production, marketing and financial alternatives. *Cowchip$ is made up of six modules: **Records, Troubleshooting, Cow Lifetime Productivity, Herd Nutrition, Adding Value to the Calf** and **Utility.** It requires an IBM PC or compatible, 640K available internal memory of RAM, CGA graphics or better and 3.5 Mb hard drive space.

I. Records

This module provides the format for entering information required to evaluate the production management of a cow-calf herd. Information is entered

either on a herd basis or an individual cow basis. It takes approximately 30 min. to enter and analyze the records on a herd basis and one to two minutes per cow on an individual cow basis. A summary of the herd production information for the 1994/95 through 1991/92 production cycles is presented in Table 1. This report gives us the basic information on growth, open cows, length of the calving span, calving pattern, calf death loss, herd production efficiency and cost of production.

Calving Pattern

Calving patterns are determined from the date of the first calf born within each age group and overall. Calves that are born early (i.e., premature) should not be included in the calving pattern. *Cowchips$* takes care of this when individual cow records are entered by determining a first valid calving date. First valid calving date, within age group, is defined as the start of breeding season plus 272 days (gestation length minus standard deviation). The first calf born on or after the first valid calving date is the date when the first calf was born.

The calving patterns for first calf heifers, three year old cows, mature cows and all cows calving for our sample herd are presented in Figure 1. First calf heifers follow the recommended calving span of 60 to 80 days and calving pattern of 60-70%, 20-25% and 5-10% of the calves born in the first, second and third 21-day periods (Basarab, 1991). The calving pattern for the three year old cows is not optimum and reflects the mixing of first calvers with the main cow herd. First calvers require energy for maintenance, growth, lactation and repair of the reproductive tract. However, this group is often mixed with the main cow herd where they have trouble competing with older, stronger and heavier animals. As a result, days to first heat is extended by one cycle and conception rates lowered. The calving pattern observed for the mature cows is partially the result of the management difficulties being experienced with the first calvers.

Table 1. Herd Production Summary.

	Production Cycle			
Reproduction	1994/95	1993/94	1993/92	1991/92
Females exposed to breeding	139	96	153	125
Bred females retained	119	96	115	125
Length of the breeding season, day	60	90	85	76
Culling rate, %	0	0	0.9	0
Open cows, %	0	0	0.9	0
Length of the calving span, day	67	67	84	77
Calving Pattern				
All cows calving 1 - 21 days	44.8	52.6	38.7	41.5
22 - 42 days	34.5	36.1	41.2	37.7
43 - 63 days	14.7	9.3	16.0	16.9
64 plus days	6.0	2.1	4.2	3.8
Calf Death Loss				
Assisted births - 1st calvers, %	17.1	20.0	3.6	23.4
- 2nd calvers, %	3.4	0.0	0.0	12.5
- mature cows, %	0.0	13.2	15.1	1.4
- all cows calving, %	5.7	12.1	7.6	10.0
Death loss of calves, %	3.3	8.1	4.3	5.4
Growth performance				
Average age at weaning, day	196	262	240	269
Actual weaning wt - steers, lb	599	876	810	817
- bulls, lb	578	918	823	
- heifers, lb	528	744	732	745
- all calves, lb	563	796	767	775
200-day adjusted weaning wt, lb	573	629	660	601
Production efficiency				
Calves weaned/cow exposed, %	99.1	94.8	95.7	98.4
Calf weaned/cow exposed, lb	558	755	734	763
Calf weaned/ 100 lb cow exposed, lb	37.1	50.3	48.9	50.8
Calf weaned (adj)/cow exposed, lb	568	596	631	591
Calf weaned (adj)/100 lb cow exposed,lb	37.9	39.7	42.1	39.4
Cost of Production				
$ cost/lb calf weaned	0.89	0.57	0.56	0.55

200-day ADG

The Calving and Weaning Report sorted by the 200-day index is given in Table 2. This information can be reported as entered or sorted by maternal score, cow age, 200-day ADG index, sire group, weaning contemporary group, management group or any combination of these variables. Reports for post weaning gain and

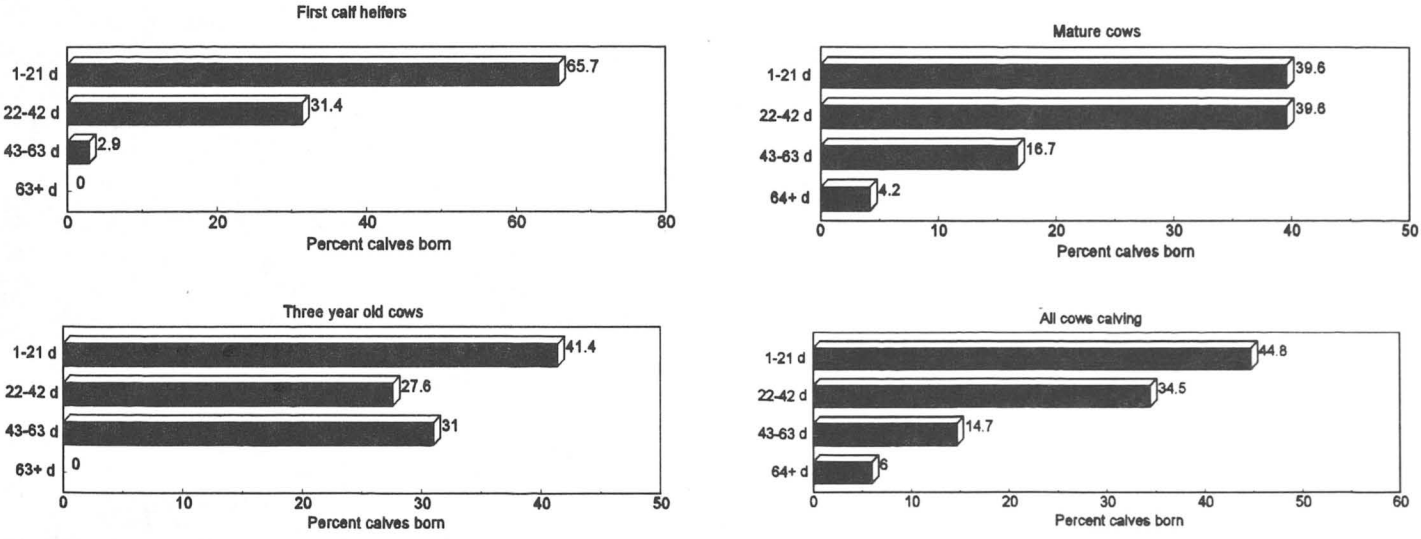


Figure 1. Calving pattern for calves born in 1995.

Table 2. Calving and weaning report sorted by 200 day ADG index (1994/95).

Cow ID	Cow birth year	Cow Breed	Calving Information										Weaning Information Date: Aug 05, 1995					
			Calf ID	Calf Sire Breed	Sex (H) (S)	Calf birth date 1995	Calf birth wt. (lb)	Calv -ing peri -od	Calf birth condi -tion	Calv -ing ease	Cow prob lems	Mat ernal score	Con- temp Grp.	Sex (H) (S)	Actual wean wt (lb)	Age at wean -ing	200 day adj ADG	200 day ADG Index
299	92	ChCh	595	ChCh	M	02/05	108	2	1	1	0	4	1	S	703	181	3.47	127
2112	92	ChCh	552	ChCh	M	01/14	102	1	1	1	0	3	1	S	765	203	3.45	126
2116	92	ChCh	558	ChCh	F	01/16	114	1	1	1	0	3	1	F	684	201	2.98	124
254	92	ChCh	102E	ChCh	F	02/09	114	3	1	1	0	5	1	F	613	177	2.96	123
095	90	ChCh	571	ChCh	F	01/21	118	2	1	1	0	4	1	F	686	196	2.90	121
369	93	ChCh	574	ChCh	M	01/23	113	2	1	2	0	5	1	S	689	194	3.30	121
375	93	ChCh	594	ChCh	F	02/04	107	2	1	1	0	4	1	F	583	182	2.88	120
60U	86	ChCh	557	ChCh	M	01/16	140	1	1	1	0	3	1	S	800	201	3.28	120
209	92	ChCh	5109	ChCh	M	02/20	96	3	1	1	0	5	1	S	599	166	3.21	118
039	90	ChCh	544	ChCh	M	01/12	118	1	1	1	0	3	1	S	778	205	3.22	118
224	92	ChCh	108E	ChCh	F	02/19	99	3	1	1	0	5	1	F	538	167	2.77	115
Sample Report only: Cows between Index 115 and 52 have been skipped to minimize table length.																		
365	93	ChCh	569	ChCh	M	01/21	83	1	1	1	0	3	1	S	297	196	1.43	52
290	92	ChCh	5122	ChCh	F	03/04	70	4	1	1	0	6						
2126	92	ChCh	5121	ChCh	F	03/04	85	4	1	1	0	6						
297	92	ChCh	585	ChCh	M	01/28		2	3	1	0	6						
2102	92	ChCh	560	ChCh	F	01/17	79	2	1	1	0	4						
3112	93	ChCh	530	ChCh	F	01/08	74	1	1	1	0	3						
307	93	ChCh	582	ChCh	F	01/26		2	3	1	0	6						
3105	93	ChCh	503	ChCh	M	12/23			3	1	0							
122	91	ChCh	564	ChCh	F	01/18	88	2	1	1	0	4						
136	91	ChCh	5111	ChCh	F	02/22	78	3	1	1	0	5						
Cows = 119													Average		562	196	2.56	

365-day index are also available. Average daily gains are adjusted for age of dam and sex of calf within breed. Different formula are applied depending on whether birth weight is known or unknown. The program also accommodates twins and fostered calves. The formula and adjustment factors used follow the National Standards Document for the Genetic Improvement of Canadian Beef Cattle (1993).

Effect of calving period, cow age and sire on production

A number of reports can be generated to examine the effect of calving period, cow age, calving period and cow age, sire group, weaning contemporary group, management group (i.e., different pastures, gender, growth implants) and finishing contemporary group on various production traits. For example, Table 3 illustrates the effect of calving period on weaning weight. In our sample herd, calves born in the fourth period of the calving span weighed 57 lb less than calves born in the first period.

Table 4 shows the effect of cow age on production traits. This report can be used to examine which age groups are having the most calving difficulty and calf death loss. Table 5 allows the manager to examine the calving assistance rate resulting from individual sires or groups of sires. For example, sire 392 had a 22.7% assisted birth rate. All assisted births occurred in two

Table 3. Effect of calving period on production traits.

Calving period	No. Of calves	Avg birth date	Avg. Birth wt. (lb)	Assist rate (%)	Calf death loss (%)	Avg. Wean wt. (lb)	Avg. Wean age (day)	Avg finish wt (lb)
1-21 d	56	02/11	89.7	10.7	1.8	567	208	NA
22-42 d	38	01/27	96.7	2.6	5.3	573	189	NA
43-63 d	15	02/18	96.8	0.0	0.0	526	169	NA
64-84 d	7	03/03	97.0	0.0	14.3	510	156	NA
Weaning date: August 5, 1995								

Table 4. Effect of cow age on production traits (1994/95).

Cow age (yr)	No. Of calves	Avg birth date	Avg. Birth wt. (lb)	Assist rate (%)	Calf death loss (%)	Avg. Wean wt. (lb)	Avg. Wean age (day)	Avg finish wt (lb)
2	43	03/14	86.2	14.0	7.0	533	203	NA
3	29	01/31	93.4	3.4	6.9	566	187	NA
4	20	01/26	96.4	0.0	0.0	594	193	NA
5	23	02/18	95.1	0.0	0.0	579	199	NA
6	2	02/20	112.5	0.0	0.0	547	166	NA
7	1	12/27	91.0	0.0	0.0	596	221	NA
8	2	01/31	80.0	0.0	0.0	501	186	NA
9	2	02/09	123.5	0.0	0.0	679	178	NA
Weaning date: August 5, 1996 NA = finishing data was not available								

and three year old cows (Table 4). While all of these assisted births are easy pulls, this may be a warning that birth weights are on the verge of becoming too heavy (89 lb). Basarab *et al.* (1993) showed that calving difficulty follows a threshold birth weight model. Calving difficulty increases slowly and linearly as birth weight increases. This increase continues until a threshold birth weight is reached; approximately 89 lb for continental x continental heifers. Once this threshold birth weight is passed in first calf heifers, calving difficulty increases rapidly.

Table 5. Effect of sire group on production traits(1994/95).

Sire group	No. of calves	Avg birth date	Avg. Birth wt. (lb)	Assist rate (%)	Avg. Wean wt. (lb)	Avg. Wean age (d)	Avg finish wt (lb)
343	15	02/02	89.2	6.7	560	208	NA
380	17	02/16	87.6	0.0	508	172	NA
SKY	6	01/24	105.5	0.0	609	193	NA
105	20	02/10	93.9	0.0	606	194	NA
975	19	02/13	103.6	0.0	599	192	NA
QUAL	5	04/01	99.0	0.0	553	201	NA
392	22	02/20	89.9	22.7	544	197	NA
393	18	03/31	82.6	5.6	524	208	NA
Weaning date: August 5, 1996 NA = finishing data was not available							

II. Troubleshooting

This module compares the four GOLD (growth, open cows, length of the calving span and death loss of calves) production indicators for a herd with district, regional, or provincial values and industry benchmarks. It evaluates these indicators for strengths and weak-

nesses and identifies opportunities for improvement. It also comments briefly on the most probable cause of this weakness with references to the Beef Herd Management Reference Binder and Study Guide (1996). The production data base in *Cowchip$* is based on records from approximately 6,400 Alberta herds and 500,000 breeding females. A partial summary of these data are reported by Mathison (1993). *Cowchip$* can be customized with data bases from other regions, states or countries.

The production efficiency report is given in Table 6. The production efficiency of our sample herd is higher than the regional average, but lower than the desired benchmark value. This result is not only numerically and graphically illustrated, but is also presented in terms of dollars of lost opportunity. For example, the opportunity for improvement in our sample herd is $12,270.39 or approximately $103/cow wintered. This value is determined by comparing a herd's production indicators to the four GOLD benchmark indicators in *Cowchips$*. The four GOLD indicators are:

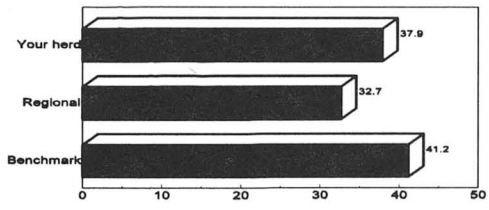
- Growth: wean 45% of cow mature weight when the calf is 200 days old,
- Open cows: 4% of cow exposed to breeding,
- Length of the calving span: 63 day calving span with 70, 21 and 9% of the calves born in the first, second and third calving periods, and
- Death loss of calves: 4% of calves born.

Table 6. Troubleshooting report: Production efficency.

NAME: XXXXX XXXXXXXXX YEAR: 1995

Production Efficiency	Your herd	Regional Average	Benchmark
Actual weaning weight - lb calf weaned/cow exposed to breeding	558	447	609
-lb calf weaned/100 lb cow exposed to breeding	37.2	33.4	40.6
200-day adj. weaning weight - lb calf weaned/cow exposed to breeding	568	440	621
- lb calf weaned/100 lb cow exposed to breeding	37.9	32.7	41.4

PRODUCTION EFFICIENCY



OPPORTUNITIES FOR IMPROVEMENT

Your Key Production Indicators		Opportunity for Improvement
G rowth (weaning weight)	= 563 lb	$10,717.46
O pen cows	= 0.0%	$ 0.00
L ength of the calving period	= 67 days	$ 1,552.93
D eath loss of calves	= 3.3%	$ 0.00
Gross Opportunity For Improvement is		**$12,270.39**

Regional data is based on 171 herds and 11,626 cows.

Troubleshooting reports give interpretive information on the main reasons for herd weaknesses with corresponding pages numbers for further reading in the Beef Herd Management Reference Binder. Other reports generated by this module are:

- GOLD indicators
- Opportunities for improvement
- Growth
- Open Cow
- Length of the Calving Span
- Death Loss of Calves
- Year to Year Comparison
- Herd to Herd Comparison

III. Cow Lifetime Productivity

This module examines the lifetime productivity of a cow within a herd. It does this by calculating a Most Probable Producing Ability (MPPA) value for each cow in the herd in terms of pounds of calf weaned per year and pounds of calf weaned per unit of feed inputs (biological efficiency). These MPPAs can then be used as one of the tools to cull for low productivity or for selecting sons and daughters from cows with a high lifetime productivity.

Astute cow-calf managers know that the unit cost of production is among the most important factors affecting profitability. More specifically, feed costs account for as much as 60 to 70% of the total production costs. A major determinant of feed costs is cow size and milk production. Several comprehensive reviews on crossbreeding and optimum cow size have concluded that matching the genetic resource or brood cow's biological type to specific environmental and management conditions is critical to production efficiency (Fredeen *et al.* 1981; 1982; Smith *et al.* 1987a, b; Cundiff *et al.* 1984; Montano-Bermudez and Nielson, 1990; Jenkins and Ferrell, 1992, 1994; Richie, 1996). General recommendations for matching breed or biological types to different production environments include:

- restricted feed resources, arid climate: British x British
- medium feed resources, semi-arid climate: British x small Continental.
- abundant feed resources, adequate precipitation: British x large Continental.
- sub-tropical environment: British x Bos *indicus*

While these recommendations on matching the biological type with the production environment are a good starting point, they do not go far enough on a within herd basis. The reason for this is that the amount of variation in any trait is still considerable within a breed or biological type; there are still cow types that are not

matched to their environment.

An on-farm method for determining biological efficiency would have practical application. Many measures of biological efficiency have been applied under research conditions (Cundiff *et al.* 1984; Smith *et al.* 1987a, b; Doornbos *et al.* 1987; Kattnig *et al.* 1993; Melton and Colette, 1993). All measures use calf weight or carcass weight outputs to feed energy or organic matter inputs. Under commercial conditions measuring individual cow feed intake is not practical. Fortunately, feed intake for maintenance is proportional to metabolic body weight (NRC, 1984) and weaning weight is highly (R^2 = 0.40) related to milk production (Butson *et al.* 1980). For example, cow weight at weaning and milk production accounted for over 90% of the variation in total feed energy inputs (Mcal DE/cow/yr) of first-cross dams in the foreign cattle breed evaluation program initiated by Agriculture Canada (Smith *et al.* 1987a, b). These data also showed a strong relationship between an indirect measure of biological efficiency (calf weaning weight/cow metabolic weight at weaning plus one-half calf metabolic weaning weight) and the ratio of calf weaning weight to total feed energy inputs (Brandon, R^2 = 0.97; Manyberries, R^2 = 0.91;=.0001). Therefore, the following equation was developed to estimate cow biological efficiency on the farm:

$$\frac{\text{Weaning weight adjusted for gender}}{((\text{Cow wt})^{0.75}) + ((((\text{adj wean wt} - \text{birth wt})/\text{calf age}) \times (\text{calf age}/2)) + \text{calf birth wt})^{0.75}},$$

where cow weight and calf age are determined at weaning.

This equation along with others were incorporated into *Cowchip$* to estimate cow biological efficiency in comparison to its contemporaries. Table 7 illustrates this for the four years of data for our sample herd. Cow 039 has the highest lifetime production efficiency and is likely of produce 821 lb calf weaned/year. A more detailed individual cow history is given in Table 8. This information becomes valuable for culling and for the selection of replacements which come from dams with above average fertility and longevity. It is also useful to determine if cow size and milk production are becoming mismatched with available production and management resources.

IV. Herd Nutrition

This module contains a table of common feeds and a table of basic nutrient allowances for beef cattle. Feed energy is described in terms of digestible energy (DE): Mcal DE/lb of feed; Mcal DE/day recommended and supplied. All nutrient analyses and amounts fed are on an as-fed basis. The program allows the user to balance for all the major and most of the micro-nutrients.

This module allows you to print out the balanced ration, complete with the formula for any batch mixes created, and a summary of several balanced rations. Future developments for this module include adding an imperial/metric switch, an energy switch for DE, Total Digestible Nutrients (TDN) and Net Energy (NE), expanding the nutrient list to include more micro-nutrients, neutral detergent fiber, acid detergent fiber, rumen degradable protein and undegradable protein, formula calculated animal requirements based on

Table 7. Lifetime Production efficnency report sorted by cow biological efficiency (1992/95).

Cow ID	Yrs in hrd	Calv -ing Inter - val (days)	No of Calves Born B	H	Calf birth Wt.. (lb)	Calv -ing period	Calf birth condi -tion	Calv -ing ease	Cow prob - lems	Mater -nal score	Weaning Age	Wt.	200 - day adj. gain	MPPA Calf Wean -ed lb/yr	MPPA Cow Effici - ency Index
039	4	364	3	1	107	2	1	1	0	4	247	876	3.25	821	117
60U	4	367	1	3	114	1	1	1	0	3	256	864	2.95	812	115
2116	2	357	0	2	115	2	1	2	0	5	231	802	3.17	747	115
199	3	343	2	1	91	2	1	1	0	4	243	831	3.19	778	115
750	4	374	3	3	97	1	2	1	0	4	241	767	2.89	844	114
299	2	385	2	0	106	2	1	2	0	4	225	813	3.43	753	114
293	2	369	1	1	125	2	1	2	0	5	228	812	3.23	752	114
254	2	367	1	1	112	3	1	1	0	5	212	813	3.48	753	113
2112	2	325	2	0	95	2	1	1	0	4	217	779	3.42	734	113
122	3	372	2	2	86	2	1	1	0	4	251	812	3.06	798	113
369	1		1	0	113	2	1	2	0	5	194	689	3.30	679	112
Sample Report only: Cows between biological Index 112 and 86 have been skipped to minimize table length.															
065	4	371	2	2	89	1	2	1	0	4	253	716	2.57	574	86
027	4	377	3	1	95	2	1	1	0	4	229	705	2.74	568	84
145	3	364	2	1	98	3	1	1	0	5	189	652	3.07	514	81
2126	2	420	0	2	88	3	1	1	0	5	276	895	3.18	544	78
297	2	397	2	0	84	2	2	1	0	6	288	919	3.23	551	78
2102	2	365	1	1	81	2	1	1	0	4	267	842	3.18	529	75
290	2	422	0	2	76	3	1	1	0	5	278	724	2.58	495	73
266	2	422	1	1	96	3	1	1	1	5	156	476	2.48	424	70
307	1		0	1		2	3	1	0	6				0	0
3112	1		0	1	74	1	1	1	0	3				0	0
3105	1		1	0		0	3	1	0	0				0	0

Table 8. Individual Cow Lifetime Production report (1992/95).

RECORD FOR COW 039

Birth year: 90
Birth weight:
Calving period born in:
Maternal score of dam:
Weaning weight:
200 day ADG index:

Dam breed: CHCH
Sire breed: CHCH
2 yr weight (lb):
3 yr weight (lb):
4 yr weight (lb):
Mature wt. (lb):

Purchase Date:
Purchased from:
Selling date:
Sold to:

CALVING RECORD FOR COW 039

Calving Date yy	mm	dd	calv -ing inter -val (d)	calf ID	calf sire breed	calf sex (F) or (M)	Calf birth wt (lb)	calv -ing pern -od	calf condi -tion	birth	calv -ing ease	cow prob -lems	mater -nal score	sex	age at wean -ing	CT grp	wean wt (lb)	200 day adj gain	200 day ADG index	cow effici ency index
92	01	16		275	ChCh	F	89	2	1	1	0	4	F	270	1	796	2.88	112	117	
93	01	20	369	367	ChCh	M	113	2	1	1	0	4	S	269	1	983	3.42	107	129	
94	02	10	386	489	ChCh	M	108	3	1	1	0	5	S	243	1	945	3.49	109	116	
95	01	12	336	544	ChCh	M	118	1	1	1	0	3	S	205	1	778	3.22	118	131	

Pounds calf weaned per mating opportunity
Cow Average = 876 lb/year
Herd average = 673 lb/year

Most Probable Producing Ability (MPPA) for Cow 039 = 821 lb year
OVERALL COW EFFICIENCY INDEX = 117

the 1996 NRC and a Windows version.

V. Adding Value to the Calf

This module compares marketing alternatives for a cow-calf manager. Marketing alternatives include timing of selling weaned calves, preconditioning/ pre-immunization, creep feeding, early weaning, backgrounding, yearlings on grass and finishing. Feed costs are based on a formulated ration from the Herd Nutrition module. Projected calf and feeder price is adjusted for season and a price-weight slide based on historical data. These data bases can be customized for local conditions. Table 9 compares four marketing alternatives for the 600 lb steer calves weaned by the farm manager in our sample herd:

1. selling weaned calves immediately after weaning on August 5, 1995;
2. selling calves after delaying weaning until August 31, 1995;
3. weaning calves on August 31, 1995 and then raising them at 3 lb/day for 130 days and
4. finishing until the steers reached slaughter weight of 1400 lb.

Table 9. Economic projections for various marketing alternatives.

Steers - Central Alberta	Sell Calf off Cow	Finishing-130 days	Finishing-140 days
Start Date	95/08/05	95/09/01	96/01/10
Start weight, lb	600	639	1029
Purchase price, $/lb	0.99	0.97	0.73
Feeder value, $/hd	572.47	619.83	751.17
Projected ADG, lb/day	1.50	3.00	3.00
Days on feed	26	130	140
Production Costs, $/hd			
Suppl. feed costs[1]	0.00	155.55	237.71
Other costs - pasture	13.00	0.00	0.00
- processing and vet	0.00	10.00	5.00
- death loss[2]	0.00	6.38	3.84
- buying costs	0.00	0.00	0.00
- selling costs[3]	18.58	18.79	19.33
- trucking to market	3.00	3.00	3.00
- feedlot yardage	0.00	26.00	28.00
- profit and risk	0.00	0.00	0.00
- interest[4]	3.30	19.88	26.70
Feed and other costs, $/hd	37.88	239.60	323.58
Total costs, $/hd	610.35	859.43	1074.75
Projected sale date	95/08/31	96/01/09	96/05/29
Shrink, %	3.0	3.0	3.0
Projected sale weight, lb	620	998	1406
Projected sale price, $/lb	0.98	0.75	0.79
Projected feeder value, $/hd	607.60	748.50	1109.18
Feed cost/lb gain, $/lb	0.33	0.40	0.57
Total cost/lb gain, $/lb	0.97	0.61	0.77
Break-even selling price, $/lb	0.98	0.86	0.76
Net Return (NR), $/hd[5]			
- bought and sold at each phase	-2.75	-110.93	34.42
- cumm., not sold until slaughtered	18.83	-70.31	-35.89

1. Supplemental feed costs are based on the following prices: mixed hay $70/ton; barley silage $34/ton; barley grain $123/ton; feedlot supplement $150/ton.
2. Death loss costs=(initial feeder value + trucking + induction costs + 7 days of feed) x (death loss rate/100).
3. Selling costs include auction commission, Alberta Cattle Commission check-off, brand inspection, transit insurance and producer security program.
4. Interest costs = (initial feeder value + half total feed costs) x (days on feeding/365) x (interest rate/100).
5. The "cummulative, not sold until slaughter" values are calculated by adding back selling and trucking costs to "sold after each phase".

It is clear that the best situation for the cow-calf manager was to sell calves immediately after weaning in the early part of August. The other alternatives had an overall net negative return. Retained ownership under these conditions was risky particularly with where the beef industry was in the cow-calf cycle.

VI. Utility

This part of the program allows the user to edit individual cow records more easily and quickly. Individual cow records can also be entered from the Utility instead of from the Individual Cow Records screen of the Records module. The Utility also allows the user to import and export ASCII files. This makes it possible to transfer *Cowchip$* cow data to most other software programs. For example, data entry and editing of cow data could be carried out in WordPerfect and then imported to *Cowchip$*.

Conclusion

Cowchips$ has the following strengths and weaknesses:

Strengths

- It is cow based; it is not progeny based.
- It is built around the production cycle of the beef herd.
- It accepts records on either a herd basis or individual cow basis.
- It interprets the data in terms of dollars of opportunity and a troubleshooting module.
- It compares your herd GOLD production indicators to district and regional levels.
- It integrates record keeping with production, nutrition, marketing and finance.
- It describes cow output in terms of lifetime biological efficiency.
- It has an easy to use ration formulation program.
- It integrates ration balancing with cost and marketing alternatives.
- All data bases in the program can be customized.

Weaknesses

- It is not Windows-based.
- It lacks a complete bull inventory and evaluation.
- It lacks a complete cow inventory.
- It lacks a detailed animal health reporting system.
- Its Herd Nutrition module is not in TDN and NE.
- It lacks a carcass evaluation component.

The above changes are presently being completed and are scheduled for release in the summer of 1997.

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Abstract

Assessment of two devices for measuring tympanic membrane temperature in swine, dairy cattle, and dairy calves

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We compared tympanic membrane temperature readings obtained by 2 commercially available devices with rectal temperature readings obtained with a standard mercury thermometer in dairy cattle, dairy calves, and swine. Tympanic membrane temperature readings from both devices were lower than those obtained using a rectal thermometer. Repeated measurements of individual cattle resulted in consistent body temperature readings for both devices. Because all animals were visibly healthy, these results suggest that the tympanic membrane temperature readings obtained with either device may be an adequate assessment of health status.